<110> DE BLOCK, MARC

<120> GENETIC TRANSFORMATION USING A PARP INHIBITOR

<130> 2121-0127P

<140> 08/817,188
<141> 1997-05-15

<150> PCT/EP96/03366
<151> 1996-07-31

<150> EP 95401844.6
<151> 1995-08-04

<160> 5

<170> PatentIn Ver. 2.0

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<223> T-DNA right border (RB)

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<223> 3'g7: 3' untranslated region containing the
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      T-DNA

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<222> Complement((331)..(882))
<223> bar: region coding for phosphinotricin acetyl
      transferase

<220>

<221> misc_feature

<222> Complement((883)..(2608))

<223> promoter region of Rubisco small subunit gene of
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<220>

<221> misc_feature

<222> Complement((2658)..(3031))

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<223> barnase: region coding for barnase

<220>

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<222> Complement((3368)..(4876))

<223> PTA29: promoter region of TA29 gene of Nicotiana
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<220>
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<223> PE1: promoter region of E1 gene of rice

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<223> P35S: 35S promoter region of Cauliflower Mosaic
        Virus

4

<220>

<221> misc_feature

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<223> bar: region coding for phosphinotricin
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<220>

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       T-DNA

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5

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6

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<223> promoter region of T72 gene of rice

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7

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<220>
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<220>
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<222> Complement((803)..(1138))
<223> barnase: region coding for barnase

<220>
<221> misc_feature
<222> Complement((1138)..(2317))

8

<223> PCa55: stamen-specific promoter from corn gene
      CA55

<220>
<221> misc_feature
<222> (2355)..(3187)
<223> p35S: 35S promoter region of Cauliflower mosaic
      virus

<220>
<221> misc_feature
<222> (3188)..(3739)
<223> bar: region coding for phosphinoacetyl transferase

<220>
<221> misc_feature
<222> (3757)..(4017)
<223> 3' nos: 3' untranslated region containing the
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      Agrobacterium T-DNA

<220>
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<222> (699)..(702)
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10

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<223> Description of Artificial Sequence: T-DNA of
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<220>

11

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<222> (84)..(296)
<223> 3' g7: 3' untranslated region containing the
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      T-DNA


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<221> misc_feature
<222> (318)..(869)
<223> bar: region coding for phosphinotricin
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<220>
<221> misc_feature
<222> (830)..(2760)
<223> pSSU: promoter region of Rubisco small subunit
      gene of Arabidopsis thaliana


<220>
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<222> (2765)..(3058)
<223> 3' untranslated region of  the CaMV 35S transcript
      containing polyadenylation signals


<220>
<221> misc_feature
<222> (3059)..(5056)
<223> uidA: region coding for beta-glucuronidase


<220>
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<222> (4483)..(4671)
<223> IV2: region corresponding to the second intron of
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<223> P35S: 35S promoter region of CaMV


<220>
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14

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SEQUENCE LISTING

(1) GENERAL INFORMATION:

    (i) APPLICANT:
        (A) NAME: PLANT GENETIC SYSTEMS N.V.
        (B) STREET: Plateaustraat 22
        (C) CITY: Ghent
        (E) COUNTRY: Belgium
        (F) POSTAL CODE (ZIP): 9000
        (G) TELEPHONE: 32 9 235 84 58
        (H) TELEFAX: 32 9 223 19 23
        (I) TELEX: 11.361 Pgsgen

   (ii) TITLE OF INVENTION: Genetic Transformation using a PARP inhibitor

  (iii) NUMBER OF SEQUENCES: 5

   (iv) COMPUTER READABLE FORM:
        (A) MEDIUM TYPE: Floppy disk
        (B) COMPUTER: IBM PC compatible
        (C) OPERATING SYSTEM: PC-DOS/MS-DOS
        (D) SOFTWARE: PatentIn Release #1.0, Version #1.30 (EPO)

(2) INFORMATION FOR SEQ ID NO: 1:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 4946 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: linear

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: NO

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: T-DNA of plasmid pTHW107

   (ix) FEATURE:
        (A) NAME/KEY: -
        (B) LOCATION:complement (1..25)
        (D) OTHER INFORMATION:/label= RB
            /note= "T-DNA right border"

   (ix) FEATURE:
        (A) NAME/KEY: -
        (B) LOCATION:complement (97..330)
        (D) OTHER INFORMATION:/label= 3'g7
                /note= "3' untranslated region containing the
polyadenylation signal of gene 7 of Agrobacterium T-DNA "

- 40 -

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(ix) FEATURE:
    (A) NAME/KEY: -
    (B) LOCATION:complement (331..882)
    (D) OTHER INFORMATION:/label= bar
                    /note= "region coding for phosphinothricin acetyl
transferase"

(ix) FEATURE:
    (A) NAME/KEY: -
    (B) LOCATION:complement (883..2608)
    (D) OTHER INFORMATION:/label= PSSU
            /note= "promoter region of Rubisco small subunit gene of
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(ix) FEATURE:
    (A) NAME/KEY: -
    (B) LOCATION:complement (2658..3031)
    (D) OTHER INFORMATION:/label= 3'nos
                    /note= "3' untranslated region containing the
polyadenylation signal of the nopaline synthase gene of Agrobacterium
T-DNA"

(ix) FEATURE:
    (A) NAME/KEY: -
    (B) LOCATION:complement (3032..3367)
    (D) OTHER INFORMATION:/label= barnase
            /note= "region coding for barnase"

(ix) FEATURE:
    (A) NAME/KEY: -
    (B) LOCATION:complement (3368..4876)
    (D) OTHER INFORMATION:/label= PTA29
            /note= "promoter region of TA29 gene of Nicotiana tabacum"

(ix) FEATURE:
    (A) NAME/KEY: -
    (B) LOCATION:complement (4922..4946)
    (D) OTHER INFORMATION:/label= LB
            /note= "T-DNA left border"


(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:
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CAAAGTCACA TATCCATCAA ACTTCTGGTG CTCGTGGCTA AGTTCTGATC GACATGGGGT    4020
TAAAATTTAA ATTGGGACAC ATAAATAGCC TATTTGTGCA AATCTCCCCA TCGAAAATGA    4080
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(2) INFORMATION FOR SEQ ID NO: 2:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 6548 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

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(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: NO

(vi) ORIGINAL SOURCE:
     (A) ORGANISM: plasmid pTS172

(ix) FEATURE:
     (A) NAME/KEY: -
     (B) LOCATION:complement (2019..2288)
     (D) OTHER INFORMATION:/label= 3'nos
                          /note= "3' untranslated region containing the
polyadenylation signal of the nopaline synthase gene of Agrobacterium
T-DNA"

(ix) FEATURE:
     (A) NAME/KEY: -
     (B) LOCATION:complement (2289..2624)
     (D) OTHER INFORMATION:/label= barnase
                  /note= "region coding for barnase"

(ix) FEATURE:
     (A) NAME/KEY: -
     (B) LOCATION:complement (2625..4313)
     (D) OTHER INFORMATION:/label= PE1
                  /note= "promoter region of E1 gene of rice"

(ix) FEATURE:
     (A) NAME/KEY: -
     (B) LOCATION:4336..5710
     (D) OTHER INFORMATION:/label= P35S
                  /note= "35S promoter region of Cauliflower mosaic virus"

(ix) FEATURE:
     (A) NAME/KEY: -
     (B) LOCATION:5711..6262
     (D) OTHER INFORMATION:/label= bar
                  /note= "region coding for phosphinothricin acetyl
transferase"

(ix) FEATURE:
     (A) NAME/KEY: -
     (B) LOCATION:6263..6496
     (D) OTHER INFORMATION:/label= 3'g7
                  /note= "3' untranslated region containing the
polyadenylation signal of gene 7 of Agrobacterium T-DNA"


(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

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- 47 -

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TATGTTCACC ACTGATAATG AGAAGGTTAG CCTCTTCAAT TTCAGAAAGA ATGCTGACCC   4860
ACAGATGGTT AGAGAGGCCT ACGCAGCAGG TCTCATCAAG ACGATCTACC CGAGTAACAA   4920
TCTCCAGGAG ATCAAATACC TTCCCAAGAA GGTTAAAGAT GCAGTCAAAA GATTCAGGAC   4980
TAATTGCATC AAGAACACAG AGAAAGACAT ATTTCTCAAG ATCAGAAGTA CTATTCCAGT   5040
ATGGACGATT CAAGGCTTGC TTCATAAACC AAGGCAAGTA ATAGAGATTG GAGTCTCTAA   5100
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AAAGGTAGTT CCTACTGAAT CTAAGGCCAT GCATGGAGTC TAAGATTCAA ATCGAGGATC     5160

TAACAGAACT CGCCGTGAAG ACTGGCGAAC AGTTCATACA GAGTCTTTTA CGACTCAATG     5220

ACAAGAAGAA AATCTTCGTC AACATGGTGG AGCACGACAC TCTGGTCTAC TCCAAAAATG     5280

TCAAAGATAC AGTCTCAGAA GACCAAAGGG CTATTGAGAC TTTTCAACAA AGGATAATTT     5340

CGGGAAACCT CCTCGGATTC CATTGCCCAG CTATCTGTCA CTTCATCGAA AGGACAGTAG     5400

AAAAGGAAGG TGGCTCCTAC AAATGCCATC ATTGCGATAA AGGAAAGGCT ATCATTCAAG     5460

ATGCCTCTGC CGACAGTGGT CCCAAAGATG GACCCCCACC CACGAGGAGC ATCGTGGAAA     5520

AAGAAGACGT TCCAACCACG TCTTCAAAGC AAGTGGATTG ATGTGACATC TCCACTGACG     5580

TAAGGGATGA CGCACAATCC CACTATCCTT CGCAAGACCC TTCCTCTATA TAAGGAAGTT     5640

CATTTCATTT GGAGAGGACA CGCTGAAATC ACCAGTCTCT CTCTATAAAT CTATCTCTCT     5700

CTCTATAACC ATGGACCCAG AACGACGCCC GGCCGACATC CGCCGTGCCA CCGAGGCGGA     5760

CATGCCGGCG GTCTGCACCA TCGTCAACCA CTACATCGAG ACAAGCACGG TCAACTTCCG     5820

TACCGAGCCG CAGGAACCGC AGGAGTGGAC GGACGACCTC GTCCGTCTGC GGGAGCGCTA     5880

TCCCTGGCTC GTCGCCGAGG TGGACGGCGA GGTCGCCGGC ATCGCCTACG CGGGCCCCTG     5940

GAAGGCACGC AACGCCTACG ACTGGACGGC CGAGTCGACC GTGTACGTCT CCCCCCGCCA     6000

CCAGCGGACG GGACTGGGCT CCACGCTCTA CACCCACCTG CTGAAGTCCC TGGAGGCACA     6060

GGGCTTCAAG AGCGTGGTCG CTGTCATCGG GCTGCCCAAC GACCCGAGCG TGCGCATGCA     6120

CGAGGCGCTC GGATATGCCC CCCGCGGCAT GCTGCGGGCG GCCGGCTTCA AGCACGGGAA     6180

CTGGCATGAC GTGGGTTTCT GGCAGCTGGA CTTCAGCCTG CCGGTACCGC CCGTCCGGT     6240

CCTGCCCGTC ACCGAGATCT GAGATCACGC GTTCTAGGAT CCCCCGATGA GCTAAGCTAG     6300

CTATATCATC AATTTATGTA TTACACATAA TATCGCACTC AGTCTTTCAT CTACGGCAAT     6360

GTACCAGCTG ATATAATCAG TTATTGAAAT ATTTCTGAAT TTAAACTTGC ATCAATAAAT     6420

TTATGTTTTT GCTTGGACTA TAATACCTGA CTTGTTATTT TATCAATAAA TATTTAAACT     6480

ATATTTCTTT CAAGATGGGA ATTAACATCT ACAAATTGCC TTTTCTTATC GACCATGTAC     6540

GTATCGCG                                                            6548
```

(2) INFORMATION FOR SEQ ID NO: 3:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1601 base pairs
        (B) TYPE: nucleic acid

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                    (C) STRANDEDNESS: double
                    (D) TOPOLOGY: linear

           (ii) MOLECULE TYPE: DNA (genomic)

          (iii) HYPOTHETICAL: NO

           (iv) ANTI-SENSE: NO

           (vi) ORIGINAL SOURCE:
                    (A) ORGANISM: T72 promoter region

           (ix) FEATURE:
                    (A) NAME/KEY: -
                    (B) LOCATION:complement (1..1601)
                    (D) OTHER INFORMATION:/label= PT72
                        /note= "promoter region of T72 gene of rice"


           (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

CGCCGTGAGT GTCTTCTGCC GCCGAGGGGC TCTCGCTCGT CGTCGATGCC TGCACGGTGC      60

GTGCGTGTGT GTCGTGGTGG TGGTGGCGAT ACGCGACGCG AGCTCGATTT ATAGGAGGGG     120

ATCGAAGGAG GGGAGCGCGC GCGGCGAGGC CCGCGTTGCT CACCTACGCC GCGCGCATGC     180

GGCGGACGCG CGGTCGGCGC CCGCGCCGGC CGGGAGGACG AGGGCGCAAG CGTGTGAGCC     240

ACCGAACGCG CGCGCGCGCC GCGGCGCGAA CTCTCCATCG CGTCGCGGCG AGCCGAGAGC     300

CGACGAGAGC GTTTCGCGCG CGCGGTTGGG CCGGCGACAA GATGGGCCGT AGCCCTGGGC     360

CTCGTGCCAT CTTTTTTTTT CTTTTTTGCC TTTTTTGGCC TGGCAATTTC TTTTTGTTTT     420

TAGTCTTTTT GTGGTGATAA TGTGTCGTCT TCCGGTGAAC TAATTTACTC GTTGATCTTT     480

TTGTGTCCCT TCGAATATTC GCAGTGGTAG AAGATGACTA CTACTACCAG TAGTTGATCT     540

CGAATGGCAA CTTTTGTGCA GAACTTATTC CACGGCTATG TCAGCTTCCA CTGTGACTAA     600

AAAAACTACG GCCATCTTTT GGACTTGTTC TATCTTGGAA CTGAACAAAA AGGACGATCC     660

TGATGTACAC ACGGCATAGT TTCCAGCACT GGATGCCAAG TTGCCAACTG TTACCACGAT     720

AATGGAACGA CGAGATGAGA TATTATACAA GTCCAATGGA TCAAGATCCT GTGCAGTTGT     780

TATTGTAACT GTAACTTAAG CCGTTAACAT GTACATCACA TTTCCTACTC TATCAATGTC     840

TTGTGCGGGT TGTTTCAAAA AAACATGTAC ATCACATGAT CTAGAACGGA AGGCCAGGAT     900

ATGAAGTGGT ACTGCAGCAA AAACACTGTA GCAGAGATGT ACTATTATGC ATGTACTGTA     960

GCAGTCATCT AGAGCCGTTG GATCTGAAAA CGAATGGACA TGATTGTGTG CAGTTGCTAT    1020
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TGTGCAGTTA CAATAGCAAC TGCATTTGAT CTTAATCCAA GTCCAATACA TGCAGAACAG      1080

TAGCTACGAG CTGGAAAGGA TGCAAATCTG GGTGACACTG ACAGCAACCG TGGAAGAACA      1140

ACAGCAGCAA AGTCCCAGAG GGATGGCAAT TTGAAGGAAT TTAAATACTC TAATATTACT      1200

CCACCCGTTA AAAAAAACAA CTTGCTACGC ATAATATATG TTCGGATTTA TAGCGAGAAG      1260

TTAATTTTTC ATGAGAAGAA GAATATATAT GTAATATGTA CTAGGAGAGT ACTCGCTTCA      1320

TAAATATAAA TATTCATAAG TTGTCCAGTG AAGATAGCTT TAGAAAAAAC TAGTTATTTT      1380

ATTTGTCAAA TTTTAAATTT TGAAGTAGTT AGATTATCTT TCTAGTAGTT CTGATTGGTT      1440

GAAAATGTTT AGATTTTCAT GTGTTAAGAG TTCCGTATCC TAAAAATAGT AATATAATTT      1500

TAAATCATAT ATATATATAT ATATATATAT ATATATATAT ATATATATAT ATATATATAT      1560

TGTTGAACGG TTTGTGCTCT GGTTGCTATC CTGTTCTGTG G                          1601
```

(2) INFORMATION FOR SEQ ID NO: 4:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 6291 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: NO

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: plasmid pVE136

    (ix) FEATURE:
        (A) NAME/KEY: -
        (B) LOCATION:complement (425..637)
        (D) OTHER INFORMATION:/label= 3'nos
                    /note= "3'untranslated region containing the
polyadenylation signal of the nopaline synthase gene of Agrobacterium
T-DNA"

    (ix) FEATURE:
        (A) NAME/KEY: -
        (B) LOCATION:complement (803..1138)
        (D) OTHER INFORMATION:/label= barnase
            /note= "region coding for barnase"

    (ix) FEATURE:
        (A) NAME/KEY: -
        (B) LOCATION:complement (1138..2317)
        (D) OTHER INFORMATION:/label= PCa55

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                    /note= "stamen-specific promoter from corn gene CA55"

          (ix) FEATURE:
               (A) NAME/KEY: -
               (B) LOCATION:2355..3187
               (D) OTHER INFORMATION:/label= P35S
                    /note= "35S promoter region of Cauliflower mosaic virus"

          (ix) FEATURE:
               (A) NAME/KEY: -
               (B) LOCATION:3188..3739
               (D) OTHER INFORMATION:/label= bar
                         /note= "region coding for phosphinotricin acetyl
transferase"

          (ix) FEATURE:
               (A) NAME/KEY: -
               (B) LOCATION:3757..4017
               (D) OTHER INFORMATION:/label= 3'nos
                         /note= "3' untranslated region containing the
polyadenylation
                    signal of the nopaline synthase gene of Agrobacterium
T-DNA"

          (ix) FEATURE:
               (A) NAME/KEY: -
               (B) LOCATION:699..702
               (D) OTHER INFORMATION:/note= "region with unknown
                    sequence (may contain up to 15 nucleotides)"


     (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

TCGCGCGTTT CGGTGATGAC GGTGAAAACC TCTGACACAT GCAGCTCCCG GAGACGGTCA      60

CAGCTTGTCT GTAAGCGGAT GCCGGGAGCA GACAAGCCCG TCAGGGCGCG TCAGCGGGTG     120

TTGGCGGGTG TCGGGGCTGG CTTAACTATG CGGCATCAGA GCAGATTGTA CTGAGAGTGC     180

ACCATATGCG GTGTGAAATA CCGCACAGAT GCGTAAGGAG AAAATACCGC ATCAGGCGCC     240

ATTCGCCATT CAGGCTGCGC AACTGTTGGG AAGGGCGATC GGTGCGGGCC TCTTCGCTAT     300

TACGCCAGCT GGCGAAAGGG GGATGTGCTG CAAGGCGATT AAGTTGGGTA ACGCCAGGGT     360

TTTCCCAGTC ACGACGTTGT AAAACGACGG CCAGTGAATT CGAGCTCGGT ACCCGGGGAT     420

CTTCCCGATC TAGTAACATA GATGACACCG CGCGCGATAA TTTATCCTAG TTTGCGCGCT     480

ATATTTGTT TTCTATCGCG TATTAAATGT ATAATTGCGG GACTCTAATC ATAAAAACCC     540

ATCTCATAAA TAACGTCATG CATTACATGT TAATTATTAC ATGCTTAACG TAATTCAACA     600

GAAATTATAT GATAATCATC GCAAGACCGG CAACAGGATT CAATCTTAAG AAACTTTATT     660
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GCCAAATGTT TGAACGATCT GCTTCGGATC CTCTAGAGNN NNCCGGAAAG TGAAATTGAC    720

CGATCAGAGT TTGAAGAAAA ATTTATTACA CACTTTATGT AAAGCTGAAA AAAACGGCCT    780

CCGCAGGAAG CCGTTTTTTT CGTTATCTGA TTTTTGTAAA GGTCTGATAA TGGTCCGTTG    840

TTTTGTAAAT CAGCCAGTCG CTTGAGTAAA GAATCCGGTC TGAATTTCTG AAGCCTGATG    900

TATAGTTAAT ATCCGCTTCA CGCCATGTTC GTCCGCTTTT GCCCGGGAGT TTGCCTTCCC    960

TGTTTGAGAA GATGTCTCCG CCGATGCTTT TCCCCGGAGC GACGTCTGCA AGGTTCCCTT   1020

TTGATGCCAC CCAGCCGAGG GCTTGTGCTT CTGATTTTGT AATGTAATTA TCAGGTAGCT   1080

TATGATATGT CTGAAGATAA TCCGCAACCC CGTCAAACGT GTTGATAACC GGTACCATGG   1140

CTGCAGCTAG TTAGCTCGAT GTATCTTCTG TATATGCAGT GCAGCTTCTG CGTTTTGGCT   1200

GCTTTGAGCT GTGAAATCTC GCTTTCCAGT CCCTGCGTGT TTTATAGTGC TGTACGTTCG   1260

TGATCGTGAG CAAACAGGGC GTGCCTCAAC TACTGGTTTG GTTGGGTGAC AGGCGCCAAC   1320

TACGTGCTCG TAACCGATCG AGTGAGCGTA ATGCAACATT TTTTCTTCTT CTCTCGCATT   1380

GGTTTCATCC AGCCAGGAGA CCCGAATCGA ATTGAAATCA CAAATCTGAG GTACAGTATT   1440

TTTACAGTAC CGTTCGTTCG AAGGTCTTCG ACAGGTCAAG GTAACAAAAT CAGTTTTAAA   1500

TTGTTGTTTC AGATCAAAGA AAATTGAGAT GATCTGAAGG ACTTGGACCT TCGTCCAATG   1560

AAACACTTGG ACTAATTAGA GGTGAATTGA AAGCAAGCAG ATGCAACCGA AGGTGGTGAA   1620

AGTGGAGTTT CAGCATTGAC GACGAAAACC TTCGAACGGT ATAAAAAGA AGCCGCAATT    1680

AAACGAAGAT TTGCCAAAAA GATGCATCAA CCAAGGGAAG ACGTGCATAC ATGTTTGATG   1740

AAAACTCGTA AAAACTGAAG TACGATTCCC CATTCCCCTC CTTTTCTCGT TTCTTTTAAC   1800

TGAAGCAAAG AATTTGTATG TATTCCCTCC ATTCCATATT CTAGGAGGTT TTGGCTTTTC   1860

ATACCCTCCT CCATTTCAAA TTATTTGTCA TACATTGAAG ATATACACCA TTCTAATTTA   1920

TACTAAATTA CAGCTTTTAG ATACATATAT TTTATTATAC ACTTAGATAC GTATTATATA   1980

AAACACCTAA TTTAAAATAA AAAATTATAT AAAAAGTGTA TCTAAAAAAT CAAAATACGA   2040

CATAATTTGA AACGGAGGGG TACTACTTAT GCAAACCAAT CGTGGTAACC CTAAACCCTA   2100

TATGAATGAG GCCATGATTG TAATGCACCG TCTGATTAAC CAAGATATCA ATGGTCAAAG   2160

ATATACATGA TACATCCAAG TCACAGCGAA GGCAAATGTG ACAACAGTTT TTTTTACCAG   2220

AGGGACAAGG GAGAATATCT ATTCAGATGT CAAGTTCCCG TATCACACTG CCAGGTCCTT   2280

ACTCCAGACC ATCTTCCGGC TCTATTGATG CATACCAGGA ATTGATCTAG AGTCGACCTG   2340
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CAGGCATGCA AGCTCCTACG CAGCAGGTCT CATCAAGACG ATCTACCCGA GTAACAATCT     2400
CCAGGAGATC AAATACCTTC CCAAGAAGGT TAAAGATGCA GTCAAAGAT TCAGGACTAA     2460
TTGCATCAAG AACACAGAGA AAGACATATT TCTCAAGATC AGAAGTACTA TTCCAGTATG     2520
GACGATTCAA GGCTTGCTTC ATAAACCAAG GCAAGTAATA GAGATTGGAG TCTCTAAAAA     2580
GGTAGTTCCT ACTGAATCTA AGGCCATGCA TGGAGTCTAA GATTCAAATC GAGGATCTAA     2640
CAGAACTCGC CGTGAAGACT GGCGAACAGT TCATACAGAG TCTTTTACGA CTCAATGACA     2700
AGAAGAAAAT CTTCGTCAAC ATGGTGGAGC ACGACACTCT GGTCTACTCC AAAAATGTCA     2760
AAGATACAGT CTCAGAAGAC CAAAGGGCTA TTGAGACTTT TCAACAAAGG ATAATTTCGG     2820
GAAACCTCCT CGGATTCCAT TGCCCAGCTA TCTGTCACTT CATCGAAAGG ACAGTAGAAA     2880
AGGAAGGTGG CTCCTACAAA TGCCATCATT GCGATAAAGG AAAGGCTATC ATTCAAGATG     2940
CCTCTGCCGA CAGTGGTCCC AAAGATGGAC CCCCACCCAC GAGGAGCATC GTGGAAAAAG     3000
AAGACGTTCC AACCACGTCT TCAAAGCAAG TGGATTGATG TGACATCTCC ACTGACGTAA     3060
GGGATGACGC ACAATCCCAC TATCCTTCGC AAGACCCTTC CTCTATATAA GGAAGTTCAT     3120
TTCATTTGGA GAGGACACGC TGAAATCACC AGTCTCTCTC TATAAATCTA TCTCTCTCTC     3180
TATAACCATG GACCCAGAAC GACGCCCGGC CGAGATCCGC CGTGCCACCG AGGCGGACAT     3240
GCCGGCGGTC TGCACCATCG TCAACCACTA CATCGAGACA AGCACGGTCA ACTTCCGTAC     3300
CGAGCCGCAG GAACCGCAGG AGTGGACGGA CGACCTCGTC CGTCTGCGGG AGCGCTATCC     3360
CTGGCTCGTC GCCGAGGTGG ACGGCGAGGT CGCCGGCATC GCCTACGCGG GCCCCTGGAA     3420
GGCACGCAAC GCCTACGACT GGACGGCCGA GTCGACCGTG TACGTCTCCC CCCGCCACCA     3480
GCGGACGGGA CTGGGCTCCA CGCTCTACAC CCACCTGCTG AAGTCCCTGG AGGCACAGGG     3540
CTTCAAGAGC GTGGTCGCTG TCATCGGGCT GCCCAACGAC CCGAGCGTGC GCATGCACGA     3600
GGCGCTCGGA TATGCCCCCC GCGGCATGCT GCGGGCGGCC GGCTTCAAGC ACGGGAACTG     3660
GCATGACGTG GGTTTCTGGC AGCTGGACTT CAGCCTGCCG GTACCGCCCC GTCCGGTCCT     3720
GCCCGTCACC GAGATCTGAT CTCACGCGTC TAGGATCCGA AGCAGATCGT TCAAACATTT     3780
GGCAATAAAG TTTCTTAAGA TTGAATCCTG TTGCCGGTCT TGCGATGATT ATCATATAAT     3840
TTCTGTTGAA TTACGTTAAG CATGTAATAA TTAACATGTA ATGCATGACG TTATTTATGA     3900
GATGGGTTTT TATGATTAGA GTCCCGCAAT TATACATTTA ATACGCGATA GAAAACAAAA     3960
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TATAGCGCGC AAACTAGGAT AAATTATCGC GCGCGGTGTC ATCTATGTTA CTAGATCGGG      4020

AAGATCCTCT AGAGTCGACC TGCAGGCATG CAAGCTTGGC GTAATCATGG TCATAGCTGT      4080

TTCCTGTGTG AAATTGTTAT CCGCTCACAA TTCCACACAA CATACGAGCC GGAAGCATAA      4140

AGTGTAAAGC CTGGGGTGCC TAATGAGTGA GCTAACTCAC ATTAATTGCG TTGCGCTCAC      4200

TGCCCGCTTT CCAGTCGGGA AACCTGTCGT GCCAGCTGCA TTAATGAATC GGCCAACGCG      4260

CGGGGAGAGG CGGTTTGCGT ATTGGGCGCT CTTCCGCTTC CTCGCTCACT GACTCGCTGC      4320

GCTCGGTCGT TCGGCTGCGG CGAGCGGTAT CAGCTCACTC AAAGGCGGTA ATACGGTTAT      4380

CCACAGAATC AGGGGATAAC GCAGGAAAGA ACATGTGAGC AAAAGGCCAG CAAAAGGCCA      4440

GGAACCGTAA AAAGGCCGCG TTGCTGGCGT TTTTCCATAG GCTCCGCCCC CCTGACGAGC      4500

ATCACAAAAA TCGACGCTCA AGTCAGAGGT GGCGAAACCC GACAGGACTA TAAAGATACC      4560

AGGCGTTTCC CCCTGGAAGC TCCCTCGTGC GCTCTCCTGT TCCGACCCTG CCGCTTACCG      4620

GATACCTGTC CGCCTTTCTC CCTTCGGGAA GCGTGGCGCT TTCTCAATGC TCACGCTGTA      4680

GGTATCTCAG TTCGGTGTAG GTCGTTCGCT CCAAGCTGGG CTGTGTGCAC GAACCCCCCG      4740

TTCAGCCCGA CCGCTGCGCC TTATCCGGTA ACTATCGTCT TGAGTCCAAC CCGGTAAGAC      4800

ACGACTTATC GCCACTGGCA GCAGCCACTG GTAACAGGAT TAGCAGAGCG AGGTATGTAG      4860

GCGGTGCTAC AGAGTTCTTG AAGTGGTGGC CTAACTACGG CTACACTAGA AGGACAGTAT      4920

TTGGTATCTG CGCTCTGCTG AAGCCAGTTA CCTTCGGAAA AAGAGTTGGT AGCTCTTGAT      4980

CCGGCAAACA AACCACCGCT GGTAGCGGTG GTTTTTTTGT TTGCAAGCAG CAGATTACGC      5040

GCAGAAAAAA AGGATCTCAA GAAGATCCTT TGATCTTTTC TACGGGGTCT GACGCTCAGT      5100

GGAACGAAAA CTCACGTTAA GGGATTTTGG TCATGAGATT ATCAAAAAGG ATCTTCACCT      5160

AGATCCTTTT AAATTAAAAA TGAAGTTTTA AATCAATCTA AAGTATATAT GAGTAAACTT      5220

GGTCTGACAG TTACCAATGC TTAATCAGTG AGGCACCTAT CTCAGCGATC TGTCTATTTC      5280

GTTCATCCAT AGTTGCCTGA CTCCCCGTCG TGTAGATAAC TACGATACGG GAGGGCTTAC      5340

CATCTGGCCC CAGTGCTGCA ATGATACCGC GAGACCCACG CTCACCGGCT CCAGATTTAT      5400

CAGCAATAAA CCAGCCAGCC GGAAGGGCCG AGCGCAGAAG TGGTCCTGCA ACTTTATCCG      5460

CCTCCATCCA GTCTATTAAT TGTTGCCGGG AAGCTAGAGT AAGTAGTTCG CCAGTTAATA      5520

GTTTGCGCAA CGTTGTTGCC ATTGCTACAG GCATCGTGGT GTCACGCTCG TCGTTTGGTA      5580

TGGCTTCATT CAGCTCCGGT TCCCAACGAT CAAGGCGAGT TACATGATCC CCCATGTTGT      5640
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GCAAAAAAGC GGTTAGCTCC TTCGGTCCTC CGATCGTTGT CAGAAGTAAG TTGGCCGCAG        5700

TGTTATCACT CATGGTTATG GCAGCACTGC ATAATTCTCT TACTGTCATG CCATCCGTAA        5760

GATGCTTTTC TGTGACTGGT GAGTACTCAA CCAAGTCATT CTGAGAATAG TGTATGCGGC        5820

GACCGAGTTG CTCTTGCCCG GCGTCAATAC GGGATAATAC CGCGCCACAT AGCAGAACTT        5880

TAAAAGTGCT CATCATTGGA AAACGTTCTT CGGGGCGAAA ACTCTCAAGG ATCTTACCGC        5940

TGTTGAGATC CAGTTCGATG TAACCCACTC GTGCACCCAA CTGATCTTCA GCATCTTTTA        6000

CTTTCACCAG CGTTTCTGGG TGAGCAAAAA CAGGAAGGCA AAATGCCGCA AAAAAGGGAA        6060

TAAGGGCGAC ACGGAAATGT TGAATACTCA TACTCTTCCT TTTTCAATAT TATTGAAGCA        6120

TTTATCAGGG TTATTGTCTC ATGAGCGGAT ACATATTTGA ATGTATTTAG AAAAATAAAC        6180

AAATAGGGGT TCCGCGCACA TTTCCCCGAA AAGTGCCACC TGACGTCTAA GAAACCATTA        6240

TTATCATGAC ATTAACCTAT AAAAATAGGC GTATCACGAG GCCCTTTCGT C                6291
```

(2) INFORMATION FOR SEQ ID NO: 5:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 5560 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: NO

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: T-DNA of plasmid pTHW142

    (ix) FEATURE:
        (A) NAME/KEY: -
        (B) LOCATION:1..25
        (D) OTHER INFORMATION:/label= RB
                /note= "right border sequence of octopine TL-DNA from
pTiB6S3"

    (ix) FEATURE:
        (A) NAME/KEY: -
        (B) LOCATION:complement (84..296)
        (D) OTHER INFORMATION:/label= 3'g7
                /note= "3' untranslated region containing the
polyadenylation signal of gene 7 of Agrobacterium T-DNA"

    (ix) FEATURE:

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```
          (A) NAME/KEY: -
          (B) LOCATION:complement (318..869)
          (D) OTHER INFORMATION:/label= bar
                           /note= "region coding for posphinotricin acetyl
     transferase"

          (ix) FEATURE:
          (A) NAME/KEY: -
          (B) LOCATION:complement (830..2760)
          (D) OTHER INFORMATION:/label= PSSU
                  /note= "promoter region of Rubisco small subunit gene of
                   Arabidopsis thali..."

          (ix) FEATURE:
          (A) NAME/KEY: -
          (B) LOCATION:complement (2765..3058)
          (D) OTHER INFORMATION:/label= 3'35S
                  /note= "3' untranslated region of the CaMV 35S transcript
                   containing polyadenylation signals"

          (ix) FEATURE:
          (A) NAME/KEY: -
          (B) LOCATION:complement (3059..5056)
          (D) OTHER INFORMATION:/label= uidA
                  /note= "region coding for beta-glucoronidase"

          (ix) FEATURE:
          (A) NAME/KEY: -
          (B) LOCATION:complement (4483..4671)
          (D) OTHER INFORMATION:/label= IV2
                  /note= "region corresponding to the second intron of the
     ST-LS1 gene"

          (ix) FEATURE:
          (A) NAME/KEY: -
          (B) LOCATION:complement (5067..5502)
          (D) OTHER INFORMATION:/label= P35S
                  /note= "35S promoter region of CaMV"

          (ix) FEATURE:
          (A) NAME/KEY: -
          (B) LOCATION:5533..5560
          (D) OTHER INFORMATION:/label= LB
                           /note= "left border sequence of octopine TL-DNA from
     pTIB6S3"

          (ix) FEATURE:
          (A) NAME/KEY: -
          (B) LOCATION:5058..5059
          (D) OTHER INFORMATION:/note= "region with unknown
                   sequence (may contain up to 20 nucleotides)"

          (ix) FEATURE:
          (A) NAME/KEY: -
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                     (B) LOCATION:5077..5078
                     (D) OTHER INFORMATION:/note= "region with unknown
                          sequence (may contain up to 20 nucleotides)"

5            (ix) FEATURE:
                     (A) NAME/KEY: -
                     (B) LOCATION:5476..5479
                     (D) OTHER INFORMATION:/note= "region with unknown
                          sequence (may contain up to 20 nucleotides)"
10

             (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:

     AATTACAACG GTATATATCC TGCCAGTACT CGGCCGTCGA GTACATGGTC GATAAGAAAA      60
15
     GGCAATTTGT AGATGTTAAT TCCCATCTTG AAAGAAATAT AGTTTAAATA TTTATTGATA     120

     AAATAACAAG TCAGGTATTA TAGTCCAAGC AAAAACATAA ATTTATTGAT GCAAGTTTAA     180

20   ATTCAGAAAT ATTTCAATAA CTGATTATAT CAGCTGGTAC ATTGCCGTAG ATGAAAGACT     240

     GAGTGCGATA TTATGTGTAA TACATAAATT GATGATATAG CTAGCTTAGC TCATCGGGGG     300

     ATCCTAGACG CGTGAGATCA GATCTCGGTG ACGGGCAGGA CCGGACGGGG CGGTACCGGC     360
25
     AGGCTGAAGT CCAGCTGCCA GAAACCCACG TCATGCCAGT TCCCGTGCTT GAAGCCGGCC     420

     GCCCGCAGCA TGCCGCGGGG GGCATATCCG AGCGCCTCGT GCATGCGCAC GCTCGGGTCG     480

30   TTGGGCAGCC CGATGACAGC GACCACGCTC TTGAAGCCCT GTGCCTCCAG GGACTTCAGC     540

     AGGTGGGTGT AGAGCGTGGA GCCCAGTCCC GTCCGCTGGT GGCGGGGGGA GACGTACACG     600

     GTCGACTCGG CCGTCCAGTC GTAGGCGTTG CGTGCCTTCC AGGGGCCCGC GTAGGCGATG     660
35
     CCGGCGACCT CGCCGTCCAC CTCGGCGACG AGCCAGGGAT AGCGCTCCCG CAGACGGACG     720

     AGGTCGTCCG TCCACTCCTG CGGTTCCTGC GGCTCGGTAC GGAAGTTGAC CGTGCTTGTC     780

40   TCGATGTAGT GGTTGACGAT GGTGCAGACC GCCGGCATGT CCGCCTCGGT GGCACGGCGG     840

     ATGTCGGCCG GGCGTCGTTC TGGGTCCATG CAGTTACTC TTCCGCCGTT GCTTGTGATG     900

     GAAGTAATGT CGTTGTTAGC CTTGCGGGTG GCTGGGAAGG CAGCGGAGGA CTTAAGTCCG     960
45
     TTGAAAGGAG CGACCATAGT GGCCTGAGCC GGAGAGGCAA CCATAGTAGC GGAAGAGAGC    1020

     ATAGAGGAAG CCATTGTTCT TCTTTACTCT TTGTGTGACT GAGGTTTGGT CTAGTGCTTT    1080

50   GGTCATCTAT ATATAATGAT AACAACAATG AGAACAAGCT TTGGAGTGAT CGGAGGGTCT    1140

     AGGATACATG AGATTCAAGT GGACTAGGAT CTACACCGTT GGATTTTGAG TGTGGATATG    1200

     TGTGAGGTTA ATTTTACTTG GTAACGGCCA CAAAGGCCTA AGGAGAGGTG TTGAGACCCT    1260
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      TATCGGCTTG AACCGCTGGA ATAATGCCAC GTGGAAGATA ATTCCATGAA TCTTATCGTT    1320
      ATCTATGAGT GAAATTGTGT GATGGTGGAG TGGTGCTTGC TCATTTTACT TGCCTGGTGG    1380
  5   ACTTGGCCCT TTCCTTATGG GGAATTTATA TTTTACTTAC TATAGAGCTT TCATACCTTT    1440
      TTTTTACCTT GGATTTAGTT AATATATAAT GGTATGATTC ATGAATAAAA ATGGGAAATT    1500
      TTTGAATTTG TACTGCTAAA TGCATAAGAT TAGGTGAAAC TGTGGAATAT ATATTTTTT    1560
 10   CATTTAAAAG CAAAATTTGC CTTTTACTAG AATTATAAAT ATAGAAAAAT ATATAACATT    1620
      CAAATAAAAA TGAAATAAG AACTTTCAAA AAACAGAACT ATGTTTAATG TGTAAAGATT    1680
 15   AGTCGCACAT CAAGTCATCT GTTACAATAT GTTACAACAA GTCATAAGCC CAACAAAGTT    1740
      AGCACGTCTA AATAAACTAA AGAGTGCACG AAAATATTAC AAATCATAAG CCCAACAAAG    1800
      TTATTGATCA AAAAAAAAAA ACGCCCAACA AAGCTAAACA AAGTCCAAAA AAAACTTCTC    1860
 20   AAGTCTCCAT CTTCCTTTAT GAACATTGAA AACTATACAC AAAACAAGTC AGATAAATCT    1920
      CTTTCTGGGC CTGTCTTCCC AACCTCCTAC ATCACTTCCC TATCGGATTG AATGTTTTAC    1980
 25   TTGTACCTTT TCCGTTGCAA TGATATTGAT AGTATGTTTG TGAAAACTAA TAGGGTTAAC    2040
      AATCGAAGTC ATGGAATATG GATTTGGTCC AAGATTTTCC GAGAGCTTTC TAGTAGAAAG    2100
      CCCATCACCA GAAATTTACT AGTAAAATAA ATCACCAATT AGGTTTCTTA TTATGTGCCA    2160
 30   AATTCAATAT AATTATAGAG GATATTTCAA ATGAAACGT ATGAATGTTA TTAGTAAATG    2220
      GTCAGGTAAG ACATTAAAAA AATCCTACGT CAGATATTCA ACTTTAAAAA TTCGATCAGT    2280
 35   GTGGAATTGT ACAAAAATTT GGGATCTACT ATATATATAT AATGCTTTAC AACACTTGGA    2340
      TTTTTTTTTG GAGGCTGGAA TTTTTAATCT ACATATTTGT TTTGGCCATG CACCAACTCA    2400
 40   TTGTTTAGTG TAATACTTTG ATTTTGTCAA ATATATGTGT TCGTGTATAT TTGTATAAGA    2460
      ATTTCTTTGA CCATATACAC ACACACATAT ATATATAT ATATATATTA TATATCATGC    2520
      ACTTTTAATT GAAAAAATAA TATATATATA TATAGTGCAT TTTTTCTAAC AACCATATAT    2580
 45   GTTGCGATTG ATCTGCAAAA ATACTGCTAG AGTAATGAAA AATATAATCT ATTGCTGAAA    2640
      TTATCTCAGA TGTTAAGATT TTCTTAAAGT AAATTCTTTC AAATTTTAGC TAAAAGTCTT    2700
 50   GTAATAACTA AAGAATAATA CACAATCTCG ACCACGGAAA AAAAACACAT AATAAATTTG    2760
      AATTAGCTTG CATGCCTGCA GGTCACTGGA TTTTGGTTTT AGGAATTAGA AATTTTATTG    2820
      ATAGAAGTAT TTTACAAATA CAAATACATA CTAAGGGTTT CTTATATGCT CAACACATGA    2880
 55   GCGAAACCCT ATAAGAACCC TAATTCCCTT ATCTGGGAAC TACTCACACA TTATTCTGGA    2940
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GAAAAATAGA GAGAGATAGA TTTGTAGAGA GAGACTGGTG ATTTTTGCGC CGGGTACCGA   3000

GCTCGGTAGC AATTCCCGAG GCTGTAGCCG ACGATGGTGC GCCAGGAGAG TTGTTGATTC   3060

ATTGTTTGCC TCCCTGCTGC GGTTTTTCAC CGAAGTTCAT GCCAGTCCAG CGTTTTTGCA   3120

GCAGAAAAGC CGCCGACTTC GGTTTGCGGT CGCGAGTGAA GATCCCTTTC TTGTTACCGC   3180

CAACGCGCAA TATGCCTTGC GAGGTCGCAA AATCGGCGAA ATTCCATACC TGTTCACCGA   3240

CGACGGCGCT GACGCGATCA AAGACGCGGT GATACATATC CAGCCATGCA CACTGATACT   3300

CTTCACTCCA CATGTCGGTG TACATTGAGT GCAGCCCGGC TAACGTATCC ACGCCGTATT   3360

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CCTTCTCTGC CGTTTCCAAA TCGCCGCTTT GGACATACCA TCCGTAATAA CGGTTCAGGC   3480

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CGCAGGTGAT CGGACGCGTC GGGTCGAGTT TACGCGTTGC TTCCGCCAGT GGCGAAATAT   3600

TCCCGTGCAC TTGCGGACGG GTATCCGGTT CGTTGGCAAT ACTCCACATC ACCACGCTTG   3660

GGTGGTTTTT GTCACGCGCT ATCAGCTCTT TAATCGCCTG TAAGTGCGCT TGCTGAGTTT   3720

CCCCGTTGAC TGCCTCTTCG CTGTACAGTT CTTTCGGCTT GTTGCCCGCT TCGAAACCAA   3780

TGCCTAAAGA GAGGTTAAAG CCGACAGCAG CAGTTTCATC AATCACCACG ATGCCATGTT   3840

CATCTGCCCA GTCGAGCATC TCTTCAGCGT AAGGGTAATG CGAGGTACGG TAGGAGTTGG   3900

CCCCAATCCA GTCCATTAAT GCGTGGTCGT GCACCATCAG CACGTTATCG AATCCTTTGC   3960

CACGTAAGTC CGCATCTTCA TGACGACCAA AGCCAGTAAA GTAGAACGGT TTGTGGTTAA   4020

TCAGGAACTG TTCGCCCTTC ACTGCCACTG ACCGGATGCC GACGCGAAGC GGGTAGATAT   4080

CACACTCTGT CTGGCTTTTG GCTGTGACGC ACAGTTCATA GAGATAACCT TCACCCGGTT   4140

GCCAGAGGTG CGGATTCACC ACTTGCAAAG TCCCGCTAGT GCCTTGTCCA GTTGCAACCA   4200

CCTGTTGATC CGCATCACGC AGTTCAACGC TGACATCACC ATTGGCCACC ACCTGCCAGT   4260

CAACAGACGC GTGGTTACAG TCTTGCGCGA CATGCGTCAC CACGGTGATA TCGTCCACCC   4320

AGGTGTTCGG CGTGGTGTAG AGCATTACGC TGCGATGGAT TCCGGCATAG TTAAAGAAAT   4380

CATGGAAGTA AGACTGCTTT TTCTTGCCGT TTTCGTCGGT AATCACCATT CCCGGCGGGA   4440

TAGTCTGCCA GTTCAGTTCG TTGTTCACAC AAACGGTGAT ACCTGCACAT CACCATGTTT   4500

TGGTCATATA TTAGAAAAGT TATAAATTAA AATATACACA CTTATAAACT ACAGAAAAGC   4560
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AATTGCTATA TACTACATTC TTTTATTTTG AAAAAAATAT TTGAAATATT ATATTACTAC    4620
TAATTAATGA TAATTATTAT ATATATATCA AAGGTAGAAG CAGAAACTTA CGTACACTTT    4680
TCCCGGCAAT AACATACGGC GTGACATCGG CTTCAAATGG CGTATAGCCG CCCTGATGCT    4740
CCATCACTTC CTGATTATTG ACCCACACTT TGCCGTAATG AGTGACCGCA TCGAAACGCA    4800
GCACGATACG CTGGCCTGCC CAACCTTTCG GTATAAAGAC TTCGCGCTGA TACCAGACGT    4860
TGCCCGCATA ATTACGAATA TCTGCATCGG CGAACTGATC GTTAAAACTG CCTGGCACAG    4920
CAATTGCCCG GCTTTCTTGT AACGCGCTTT CCCACCAACG CTGATCAATT CCACAGTTTT    4980
CGCGATCCAG ACTGAATGCC CACAGGCCGT CGAGTTTTTT GATTTCACGG GTTGGGGTTT    5040
CTACAGGACG GACCATGNNC CCGGGGATCC TCTAGANNTT ATAGAGAGAG AGATAGATTT    5100
ATAGAGAGAG ACTGGTGATT TCAGCGTGTC CTCTCCAAAT GAAATGAACT TCCTTATATA    5160
GAGGAAGGGT CTTGCGAAGG ATAGTGGGAT TGTGCGTCAT CCCTTACGTC AGTGGAGATG    5220
TCACATCAAT CCACTTGCTT TGAAGACGTG GTTGGAACGT CTTCTTTTTC CACGATGCTC    5280
CTCGTGGGTG GGGGTCCATC TTTGGGACCA CTGTCGGCAG AGGCATCTTG AATGATAGCC    5340
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ATGAAGTGAC AGATAGCTGG GCAATGGAAT CCGAGGAGGT TTCCCGAAAT TATCCTTTGT    5460
TGAAAAGTCT CAATANNNNG TCGACCTGCA GGCATGCAAG CTAATTCCGG GGAAGCTTAG    5520
ATCCATGGAG CCATTTACAA TTGAATATAT CCTGCCGCCG                          5560
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